

In the Claims:

Please cancel claims 5-7 and 14, without prejudice.

Please amend claims 1, 4 and 27, as follows:

1. (Twice Amended) A method for producing a boride layer on a surface by plasma boronizing comprising the steps of:

supplying a gas mixture containing a boron-releasing gas to a treatment chamber of a reactor;

generating a glow discharge in the reactor;

determining an amount of at least one excited boron-releasing gas product in the glow discharge; and

selecting production parameters of the plasma generated in the treatment chamber of the reactor depending on the determined amount of the excited boron-releasing gas product so as to maintain at least one of: at least one of a minimum value and a maximum value of the determined excited boron-releasing gas product, and at least one of a minimum value or a maximum value of a relation of one or more of the determined amount of the excited boron-releasing gas product to another glow discharge product so as to produce the boride layer on the surface.

4. (Twice Amended) The method according to claim 1, further comprising:
during a first stage, generating the glow discharge in the reactor while maintaining the gas mixture at a selected treatment temperature to first produce said boride layer and prevent formation of halogenides which cause formation of pores, and

B² during a second stage that is performed after the first stage, maintaining the gas mixture at a higher temperature than the selected temperature.

B³ 27. (Amended) A method according to claim 1 wherein the gas mixture contains more than 0% and up to 20% by volume of argon and 2% by volume to 50% by volume of boron trihalide, and wherein the remainder of the gas mixture is a hydrogen gas.

Please add new claim 40, as follows:

B⁴ 40. (New) A method for producing a boride layer on a surface by plasma boronizing comprising the steps of:

supplying a gas mixture containing a boron-releasing gas to a treatment chamber of a reactor;

generating a glow discharge in the reactor;

determining a first amount of at least one excited boron-releasing gas product in the glow discharge;

selecting first values for production parameters of the plasma generated in the treatment chamber of the reactor depending on the first determined amount of the excited boron-releasing gas product so as to maintain at least one of: at least one of a minimum value and a maximum value of the excited boron-releasing gas product, and at least one of a minimum value or a maximum value of a relation of one or more of the amount of the first determined excited boron-releasing gas product to another glow discharge product to produce the boride layer on the surface;

determining a second amount of at least one excited boron-releasing gas product in the glow discharge; and